

**SOF NATIONAL
SCIENCE OLYMPIAD**

SYLLABUS

Section – 1 : Verbal and Non-Verbal Reasoning.

Section – 2 : Chemical Reactions and Equations, Acids, Bases and Salts, Metals and Non-metals, Carbon and its Compounds, Periodic Classification of Elements, Life Processes, Reproduction in Organisms, Heredity and Evolution, Light-Reflection and Refraction, Human Eye and Colourful World, Electricity, Magnetic Effects of Electric Current, Sources of Energy, Our Environment and its Management.

Section – 3 : Higher Order Thinking Questions - Syllabus as per Section – 2.

Total Questions : 50

Time : 1 hr.

PATTERN & MARKING SCHEME			
Section	(1) Logical Reasoning	(2) Science	(3) Achievers Section
No. of Questions	10	35	5
Marks per Ques.	1	1	3

LOGICAL REASONING

1. Vinay starts walking towards East. After walking 35 km, he turns to his right and walks another 40 km. He then turns right and walks another 35 km. Finally, he turns right and walks 20 km. How far is he from the starting point and in which direction?

- (A) 20 km, North (B) 35 km, South
(C) 20 km, South (D) 35 km, North

2. Eight friends P, Q, R, S, T, U, V and W are sitting around a circle facing the centre. V is third to the right of Q and is second to the left of R. Q is second to the left of T and on the immediate right of S. U is between Q and T. P is not on the left of R.

Which of the following is the correct position of W?

- (A) On the immediate left of V
(B) On the immediate right of V
(C) Between U and V
(D) On the immediate right of R

3. Pointing to a photograph, a woman says, "He is the only son of the wife of my husband's father". How is the man related to the woman?

- (A) Son (B) Son-in-law
(C) Brother-in-law (D) Husband

4. Find the mirror image of Fig. (X) from amongst the options, if the mirror is placed to the right of Fig. (X).



Fig.(X)

- (A)  (B) 
(C)  (D) 

5. The given question is based on the 5 three-digit numbers given below:

517 394 823 976 465

If the position of the first and the second digits in each of the above numbers are interchanged, which of the following will be the third digit of the highest number?

- (A) 7 (B) 4
(C) 3 (D) 6

SCIENCE

6. Read the given statements and select the correct option.

Statement 1 : A concave mirror and a convex lens both have the same focal length in air. When they are submerged in water, they will still have the same focal length.

Statement 2 : The refractive index of water is greater than the refractive index of air.

- (A) Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1.
(B) Both statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1.

- (C) Statement 1 is true but statement 2 is false.
 (D) Statement 1 is false but statement 2 is true.

7. No heat loss occurs during flow of charge in superconductors because
 (A) Speed of charge is slow in it
 (B) It is a bad conductor of heat
 (C) It offers zero resistance
 (D) It generates very small voltage.
8. How do we know that fission isn't responsible for the sun's energy ?
 (A) Fission doesn't produce enough energy per gram of fuel
 (B) If fission were going on in the sun, the sun would explode
 (C) If fission were going on in the sun, the sun's mass would increase
 (D) There isn't very much fissionable material in the sun.

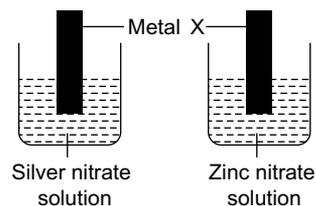
9. Which of the following statements is true with respect to diamond ?
 (A) The carbon atoms are connected to each other by metallic bonds.
 (B) In the diamond crystal, the carbon atoms are very loosely packed.
 (C) Each carbon atom in the crystal is surrounded by four other carbon atoms forming a rigid 3-D structure.
 (D) Diamond can be synthesised by subjecting pure carbon to very low pressure and temperature.

10. Which of the following statements regarding natural selection is true?
 (A) It is a process in which members of a population inherit traits that enable them to better survive and produce offspring.
 (B) It is based on the isolation of natural

populations and selective breeding of organisms.

- (C) It provides diversity without any adaptation.
 (D) All of the above

11. Strips of metal X were dipped into two solutions as shown :

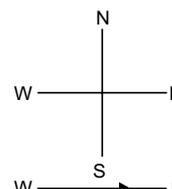


A greyish metallic deposit was found on both strips.

Which of the following could be metal X?

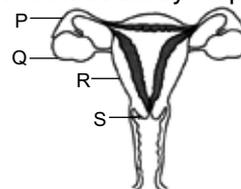
- (A) Cu (B) Mg
 (C) Pb (D) Fe

12. A constant current flows in a horizontal wire in the plane of the paper from west to east as shown in the given figure. The direction of magnetic field will be north to south, at a point



- (A) Directly above the wire
 (B) Directly below the wire
 (C) Located in the plane of the paper, on the north side of the wire
 (D) Located in the plane of the paper, on the south side of the wire

13. In which labelled part of the given figure does the fertilization of an ovum by a sperm take place?



- (A) P (B) Q
 (C) R (D) S

ACHIEVERS SECTION

14. Which of the following statements about the given reaction are not correct?

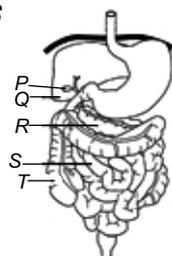
$$\text{Fe}_2\text{O}_3 + 3\text{CO} \rightarrow 2\text{Fe} + 3\text{CO}_2$$

 I. Fe_2O_3 is getting oxidised to Fe.
 II. Fe_2O_3 is acting as a reducing agent.
 III. CO is acting as a reducing agent.
 IV. CO is getting reduced to CO_2 .
 (A) III only (B) I, II and IV
 (C) II and IV (D) I and III

15. Refer to the diagram of the human digestive system to answer the following question. What would be the likely

consequence of swapping S and T i.e., from the stomach, food will pass through T to S?

- (A) The digestive enzymes would be denatured.
 (B) The intestinal contents would be highly alkaline and would damage the wall of T.
 (C) The intestinal contents would be too dry and unable to pass through S properly.
 (D) Water absorption would be highly reduced.



ANSWERS

NSO – 1. (C) 2. (B) 3. (D) 4. (A) 5. (B) 6. (D) 7. (C) 8. (D) 9. (C) 10. (A) 11. (B) 12. (A) 13. (A) 14. (B) 15. (C)